ON SCENE

THE NATIONAL MARITIME SAR REVIEW

DEPARTMENT OF TRANSPORTATION

U.S. COAST GUARD ISSUE No. 5/6-80

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SLIDE RAFT LEEWAY

Many newer commercial airliners have a device known as a slide raft which serves as a combination escape slide and life raft. At a recent SAR exercise in Australia a representative of Quantas Airlines raised the point that the new B-747 slide rafts have the peculiarity of having very little leeway drift when compared to the traditional donut shaped rafts. He said that this was due to the usual use of sea anchors combined with the strong drogue effect of the inflated stiffening tube, which runs the length of the raft underneath the floor, providing a keel effect. On the other hand it was mentioned that the DC-10 slide raft does not have a center stiffening tube and is thought to drift more like donut shaped rafts.

This all points out that, if a search is undertaken for rafts from modern commercial aircraft, information on the design and configuration of the raft equipment would have to be obtained from the operator in order to do adequate search planning.

If for instance, the inquiry reveals that it is the type described above as the new B-747 slide raft with stiffening tube, the following rationale could be used for a leeway estimate. Although there is no experimental data available on this type of slide raft, there is some opinion that, with its stiffening tube and sea anchor, it would have a leeway less than that of rafts with deep ballast systems. Since a deep ballast type raft with its canopy collapsed will exhibit a leeway of approximately 2.3% of the wind speed, a leeway figure of 2% of the wind speed for the slide raft in question does not seem unreasonable. The keel effect of the stiffening tube could result in some radical directional effects.

Remember though that not all slide rafts will be the same. Information will have to be obtained from the operator to be sure you know which type you are dealing with.

ON SCENE is a SAR publication published by the Commandant, U. S. Coast Guard as a source of information concerning current and proposed procedures as well as new developments in SAR. Articles contained herein are non-record and non-directive.

SURVIVAL TIMES WHEN WEARING PROTECTIVE GARMENTS

Search planners are being faced more more with the question of "How long might a person survive in cold water if wearing one of today's anti-exposure garments?" *Figure 7-3 in the National* SAR Manual, which gives survival times for a person wearing a wet suit or a dry suit in cold water is not valid for modern suits and, in fact, will be removed shortly. A replacement, in similar handy form, has not yet been designed. A table of estimated survival times will be given at the end of this article.

Although much is known about today's survival garments, actual experiments have been conducted only at a limited number of different water temperatures. Furthermore a wide range of individual differences have been observed among persons of different weights and body types. To a great extent, uncertainties of this nature exist for all data dealing with survival times in cold water, even for that which give estimates for persons without survival garments, such as figure 7-2 of the National SAR Manual.

GENERAL TYPES OF PROTECTIVE GARMENTS

Water survival garments today fall into three general categories. These are:

1. Dry suits with foam liners;
2. Wet suits of foam, or with foam liners; and
3. Dry suits without foam liners.

The dry suits with foam liners are bulky and cannot be worn during work situations. Their purpose is to act as a quick-donning abandon-ship suit. These have been called variously: survival suits, exposure suits and immersion suits. The latter term is being used internationally. As might be expected, theses provide the longest survival times of the three general types. Some even more effective suits have been designed which provide a layer of insulating air, but these are not yet in general use. The Coast Guard has approved a number of the dry foam suits for abandon ship purposes on Great Lakes vessels.

Wet suits of foam are modifications of divers' wet suits. They are intended for constant wear in certain work type situations such as on the decks of ships or boats, or in the cockpits of helicopters. They are worn next to the skin or with thermal underwear. The most common of these, used in the Coast Guard for many years, are the foam neoprene two-piece wet suits, usually equipped with comfort zippers. More recently manufacturers have produced a suit worn over clothing which is a fairly loose fitting coverall and which has a foam liner that protects in the water by the wet suit principle. It serves nicely as a work garment on the deck of a ship or oil rig during cold weather. Unfortunately these are also sometimes referred to as survival suits, confusing them with the dry foam suits described above for abandon-ship purposes. They can be kept separated mentally by thinking of them as deck suits rather than as abandon ship suits. A condition which modifies the wet suit type of protective capability is the fit. The looser the fit, the less protection it will provide. An experiment with a two-piece foam wet suit demonstrated a significant increase in cooling rate, and thus a decrease in survival time, when the suit was loosely fitted. A subset of the wet suit category is given in the table. This con-

sists of a grouping of partial wet suits of the shorty type, wet suit tops worn alone, and float coats with hypothermia protection.

The third general category of protective garments is the dry suit without foam. These suits are designed for constant wear in situations where comfort is needed in the working environment and where there would be no chance to put on a quick-donning suit in an emergency, such as is the case with a fighter pilot.

GARMENT	Water Temperature 35 °F	Water Temperature 53 °F
Dry suit with foam	12.6 to 46.3 hrs.	[20] to [92] * hrs.
Wet suit of, or with, foam	5.2 to 24.6 hrs.	9.4 to [49]* hrs.
Partial wet suits of foam, wet suit tops only, and float coats with hypothermia protection	2.0 to 17.7 hrs.	3.9 to 33.3 hrs.
Dry suit without foam	2.6 to 16.5 hrs.	4.5 to 32.7 hrs.

*Figures in brackets are merely best guesses. Other figures are based on experiments and mathematical manipulation of experimental data.

Qualifying Notes to Table

1. Survival times will vary within the extremes given according to the types of garments within general categories and according to the weight of the individuals. The more insulation in the garment, the greater will be the survival time. The heavier the person, the greater will be the survival time.

2. Dry suits with heavy winter-type undergarments may provide survival times similar to dry suits with foam.

3. At water temperatures greater than 53 °F, survival times will become progressively longer with increasing water temperature.

4. The data on which this table is based was obtained in calm water. Rough water may decrease survival times.

SURVIVAL IN COLD WATER

A recent case in which a fishing vessel sank is a good example of the two methods of providing protection from the cold if you have to enter the water. When the Coast Guard helicopter arrived on scene the crew found both survivors in good condition. One of them had donned a survival suit and thus protected himself with protective clothing. The other sat on an insultated fish box that helped keep him out of the water and thus protected himself by keeping as much of his body out of the water as possible.

Remember, if you have to enter cold water, protection from the cold can be had by wearing protective clothing and/or using what-ever means are available to keep as much of the body out of the water as possible.

POSSIBLE OSC CONFLICTS

In a recent case where a moored ship burned, a problem arose as to who was in charge. The major difficulty was that, within the Coast Guard both an On Scene Coordinator ashore for fire-fighting purposes and an On Scene Commander afloat were designated with no clarification as to which was in overall charge of Coast Guard efforts in the operation. Some personnel may not be aware of the provisions of the Marine Safety Manual with respect to in port fire-fighting. The pertinent part is quoted below:

> "86-6-15A GUIDELINES
>
> While is clear that the Coast Guard has an interest in fighting fires involving vessels or waterfront facilities in or along the navigable waters of the United States or fires in the vicinity of Coast Guard property, this interest does not extend to preemption of local responsibility and authority for fire-fighting. The involvement of Coast Guard forces in actual fire-fighting shall only be to a degree commensurate with our personnel and equipment levels. The Coast Guard intends to maintain its historic "assistance as available" posture without conveying the impression that we stand ready to relieve local jurisdictions of their responsibilities.
>
> All Coast Guard forces and equipment shall be under the overall command of the designated Coast Guard on-scene coordinator (OSC). District commanders, commanding officers of headquarters units or captains of the port shall assign an OSC for each incident in which Coast Guard fire-fighting forces or equipment are being utilized. This assignment will be made regardless of the actual overall supervisory authority at the scene of the emergency."

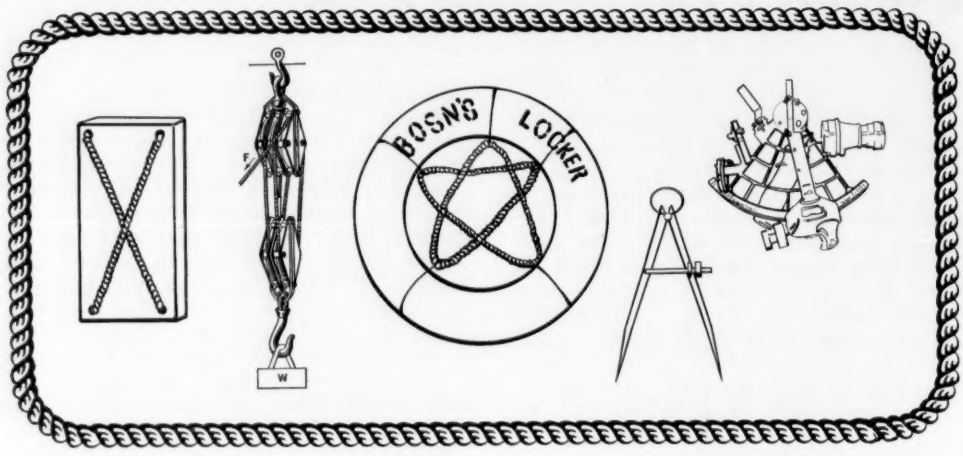
When the fire in question started, the local fire chief assumed responsibility for fighting the fire. The Coast Guard Captain of the Port (COTP) assumed the duties of On Scene Coordinator for coordinating the Coast Guard's role. Subsequently the Operations Center, when dispatching Coast Guard surface units to assist in fighting the fire from the waterside, designated one cutter as On Scene Commander. Although the good sense of the persons involved smoothed out the problem areas, there was a confusion of roles which indicated that a better understanding of responsibilities is needed in such cases.

The case also pointed out a need for seniors and operations center personnel in the chain of command to recognize the possibility of such confusion of roles and take steps to prevent, or alleviate, it early on.

In the case in point, it appears that the local fire chief was the appropriate official to be in charge of overall fire-fighting efforts and that the COTP or his designee as On Scene Coordinator should have been the appropriate Coast Guard official to coordinate all Coast Guard efforts. The designation of the Coast Guard Cutter as On Scene Commander probably should have been specifically limited to forces afloat (if such a designation was necessary at all) with a clear directive to report to the OSC in charge of Coast Guard fire-fighting efforts already on scene ashore.

Since no one situation will be just like another, each case will require good headwork to prevent a confusion of responsibility and authority.

The best way to avoid trouble is to have detailed emergency plans which establish chain of command, duties, and responsibilities in any contingency.



MORE ON LORAN C NAVIGATORS

From the 13th CG District

Editor's Note: Headquarters is in the process of providing operational approval and developing boatalts to install this equipment on MLB's and selected UTB's.

The 44' MLB pitched and rolled severely as it crossed the river bar enroute to a distressed vessel 27 miles offshore. The weather is typical for an Oregon Coast winter day: wind - 25 knots, seas -10-12 ft, with rain squalls. The two crewmen and the engineer are all seasick; only the coxswain is functioning near normal. He reaches up and flicks a toggle switch on the LORAN-C Navigational Computer; "245/25.4 miles" flashes on the screen, displaying the magnetic course and the distance to the reported position of the distressed vessel; he hits another switch and his boat's latitude and longitude flashes up on the screen.

The LORAN-C Navigator (LONA) was developed by CCGD13(eee) for use on the 44' Motor Lifeboats along the Oregon/Washington coasts to facilitate navigation offshore beyond the range of the boat's radar. It is now manufactured by the NOVASCAN Corp. of Bellevue, Wash. as the NOVASCAN 2100 Navigational Computer. The LORAN-C Navigator (LONA) is presently installed on all Thirteenth District MLB's and has simplified small boat navigation. Some of its cababilities include: computing latitude and longitude, course and speed made good, and range and bearing to a specified destination -- thus easing the burden on MLB crews. No longer must they attempt to plot Loran lines or radar ranges while rolling violently from side to side.

The LONA is watertight, durable, light (10 lbs), simple to operate and corrosion resistant. Turn points in a search pattern can be pre-programmed, and the LONA will provide course and distance to each successive point -- providing for a more accurately covered search area. Its display flashes when the MLB is within one-half mile of a pre-designated coordinate. The liquid crystal display is easily visible in daylight, and back-lighted in red for night use.

The LONA is not meant as a substitute for practical navigation, but as a tool to assist the small boat coxswain and crew. This frees them from the navigational duties to allow concentration on the search -- and at times to just hang on.

CPR UPDATE

By EMT School Staff, HM "A" School Staff & CDR Al Steinman, COMDT (G-KOM-1)

Remember how hard you had to work to master each step of cardiopulmonary resuscitation (CPR), and the endless miles of ResusciAnnie tape it took to produce a perfect tracing? Well, on 1 August 1980 brand new standards of CPR were published in the Journal of the American Medical Association which were the recommendations of the National Research Council of the American Academy of Sciences. These changes have been adopted by both the American Red Cross and the American Heart Association, and they are being incorporated into a new Commandant Instruction on CPR, which should be published early in 1981.

Now, before you assume that all your knowledge and skill in CPR is outdated, be assured that the way you learned CPR is still valid, and it will still save lives! The changes are just perfections in the techniques of CPR which came about because of medical research and general agreement among resuscitation experts. Those of you who have graduated from the EMT School or the HM "A" School since September, 1980 have already had the changes incorporated into your CPR training. For everyone else, the changes are simple, few in number, and easy to put into your CPR routine. Here are the new modifications:

1) An infant is now defined as a person less than one year of age, and a child is now defined as a person between one and eight years of age.

2) The chest compression rate for infants is now 100 per minute (instead of 100-120), and the chest compression rate for children is 80 per minute (instead of 80-100).

3) The maximum depth of chest compression in an infant is now one inch (instead of 3/4").

4) The minimum depth of chest compression in a child is now one inch (instead of 3/4").

5. To feel for a pulse in an infant, you no longer feel over the left nipple (apical pulse), but instead feel for a brachial pulse (over the inner side of the upper arm at its midpoint). The reason for this is that when a pulse is felt in the brachial artery, the heart is pumping adequately; when no pulse is felt in the brachial artery, the infant is assumed to be in cardiac arrest. The apical pulse was found to be too unreliable in infants, and the carotid pulse is too difficult to obtain on most infants due to their short, thick necks.

6. Never use an abdominal thrust (Heimlich maneuver) for treating obstructed airways in infants and children.

7. For a second rescuer joining a person already performing CPR alone:

a. The second rescuer should identify himself and let the first rescuer know that he is willing to help.

b. Without stopping CPR, the single rescuer lets the second rescuer know that he wants him to assist and is ready to switch over to two rescuer CPR.

c. The second rescuer will need to check the victim's pulse himself to assure that the first rescuer has correctly interpreted the victim's condition. He should kneel down on the side of the victim opposite the first rescuer, in position for rescue breathing, his fingers in position to feel the victim's carotid pulse. If compressions are adequate, a pulse should be felt; if no pulse is felt, the compressor's technique should be reevaluated.

d. When the second rescuer can feel a pulse with each compression, he calls out "Stop Compressions."

e. The first rescuer stops compressing for five seconds so that the second rescuer can check if the victim has a spontaneous pulse.

g. Tell the first rescuer "continue compressions."

8. Switching positions while doing two-rescuer CPR:

a. The switch is initiated when the rescuer who is performing compressions directs that a switch take place at the end of a 5:1 sequence.

b. The rescuer who is performing the ventilation, after giving a breath, moves into position to give compressions.

c. The rescuer giving compressions, after delivering the fifth compression, moves to the victim's head and checks the pulse for five seconds, but no longer.

d. If no pulse is felt, the rescuer at the head gives a breath and tells the rescuer at the chest to "continue CPR." If there is a pulse but no breathing, he should say "there is a pulse" and give artifical respiration.

9. Third rescuer relieving a tired member of 2-rescuer CPR:

If two persons are doing 2-man CPR and a third person comes in to relieve one of them, this can be accomplished by relieving either the rescuer doing the compressions or the rescuer doing the ventilations (between ventilations). Preferably the rescuer doing the ventilations is relieved first. In either case the third rescuer should relieve from the same side as the person being relieved.

10. Time allowed to discontinue CPR

Many of you were taught that 5 seconds is the maximun time limit allowable to stop CPR in order to check for effectiveness. But exceptions of up to 15 seconds were allowed for transportation problems, intubation, etc. The five second rule still applies in the new standards, but the 15 seconds has been increased to 30 seconds.

11. In-water CPR is a technique that, believe it or not, was developed by us in the Coast Guard (by BMC Tom Petrin and by Dr. Steinman). We have been teaching it for over 3 years, but only recently has the technique appeared in the national standards for CPR. Specifically, the standards state "External chest compression should not be attempted in the water unless one has had special training because it is generally impossible to perfuse the brain effectively unless the victim can be maintained in the horizontal position;...". (The underlining is added by us for emphasis), As far as we know, ours is the only EMT program which provides this "special training," and, as you remember, we emphasize keeping the victim's head and chest in a horizontal position during resuscitation and rescue. If any of you have had occasion to use in-water CPR in an actual rescue, it would be of definite interest to the entire medical community (as well as to the Coast Guard, of course). If you know of a case of in-water CPR, please inform the EMT School, the HM "A" School or Dr. Steinman at Commandant (G-KOM-1)

12. Airway Obstruction

The new CPR standards address the treatment of foreign body obstruction of the upper airway in great detail. Basically, there have been no major changes, except that, as an option, you can reverse the sequence of backblows and manual thrusts (chest or abdominal). As a refresher, the following are the recommended sequences to use:

a. FOR THE CONSCIOUS CHOKING VICTIM

(1) Identify complete airway obstruction (ask victim if he is able to speak).

(2). Apply four back blows in rapid succession.

(3). Apply four manual thrusts.

(4). Repeat four back blows and four manual thrusts until they are effective or until the victim becomes unconscious.

b. FOR THE CHOKING VICTIM WHO BECOMES UNCONSCIOUS

The rescuer should call for help, open the airway, and attempt to ventilate. If he is unsuccessful at ventilation, he should quickly perform the following:

(1). If a second person is available, he should activate the EMS system.

(2). Apply four back blows in rapid succession.

(3). Apply four manual thrusts.

(4). Apply the finger sweep. Dentures may need to be removed to improve the finger sweep.

(5). Reposition the head, open the airway, and attempt to ventilate. If the victim cannot be ventilated.

(6). Repeat steps (2), (3), and (4)

c. FOR THE VICTIM WHO IS FOUND UNCONSCIOUS AND THE CAUSE IS UNKNOWN

If the rescuer has found an unconscious victim, he should establish unresponsiveness, call for help, open the airway, establish breathlessness, and attempt to ventilate. If he is unable to ventilate, he should quickly perform the following sequences:

(1). Reposition the head, try again to ventilate. If unsuccessful and a second person is available, he should activate the EMS system.

(2). Apply four back blows in rapid succession.

(3). Apply four manual thrusts.

(4). Apply the finger sweep. (Rescuer may need to remove dentures to improve finger sweep.)

(5). Reposition the head and attempt to ventilate; if the victim cannot be ventilated.

(6). Repeat the sequence: (2), (3), and (4) as described previously.

As a final word, remember that if you have already been trained in CPR, your knowledge and skills are still valuable; try to incorporate the new changes if you can, but don't become despondent if you find the description above confusing. The new modifications are easier to learn when you're shown them than when you read about them. If you don't know CPR, you definitely should learn--you don't have to be an EMT or HM to save lives with CPR.

UNITED STATES BECOMES PARTY TO MARITIME SAR CONVENTION

On 22 July 1980, the President, with the advice and consent of the Senate, signed the instrument of ratification for the International Maritime Search and Rescue Convention. On 12 August 1980, the United States Ambassador to the United Kingdom deposited the instrument of ratification with the Secretary General of the Inter-governmental Maritime Consultative Organization (IMCO). Thus the United States became the third country to become a party to the Convention. The other two are France and the United Kingdom. The convention will not come into force until twelve months after 15 countries have become parties.

NEW SURFACE-TO-AIR VISUAL SIGNAL CODE FOR SURVIVORS

The International Civil Aviation Organization (ICAO) and the Intergovernmental Maritime Consultative Organization (IMCO) have jointly adopted a new, and simplified, set of signals for use by survivors when signaling to aircraft. The new signals are only five in number, replacing a long standing group of eighteen signals. ICAO will incorporate the new code in Annex 12, Search and Rescue to the Convention on International Civil Aviation. IMCO will include them in the first amendment to the IMCO SAR Manual---the basic manual will be issued shortly.

The amendment to Annex 12 will become effective on 15 April 1981 and the signals will become applicable for aeronautical use on 26 November 1981.

The following fiqure shows the old signals and the new.

Ground-air visual signal code for use by survivors

OLD

No.	Message	Code Symbol
1	Require doctor—serious injuries	I
2	Require medical supplies	II
3	Unable to proceed	X
4	Require food and water	F
5	Require firearms and ammunition	⩔
6	Require map and compass	□
7	Require signal lamp with battery and radio	¦ ¦
8	Indicate direction to proceed	K
9	Am proceeding in this direction	↑
10	Will attempt take-off	I>
11	Aircraft seriously damaged	⌐¬
12	Probably safe to land here	△
13	Require fuel and oil	L
14	All well	L L
15	No	N
16	Yes	Y
17	Not understood	⌋L
18	Require engineer	W

NEW

No.	Message	Code Symbol
1	Require Assistance	V
2	Require Medical Assistance	X
3	No or Negative	N
4	Yes or Affirmative	Y
5	Proceeding In This Direction	↑

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A	3		3	3	3	3	3	3	2	2	2	2	3	3		1		1	1		5	6			2	
B		5	25		25	10	40	10	3	2	2	1	2	10	1	1	1		1	1						
C	5	3		3	1	1	1	1	5	1			1	1	2	1		1	1	2	1		1			
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